

Notice of Allowability**Application No.**

10/804,203

Applicant(s)

KNAPP, RONALD H.

Examiner

FRANCIS M. LEGASSE JR

Art Unit

2878

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE filed on 8 October 2009.
2. ☒ The allowed claim(s) is/are 5-18 and 21-23.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying Indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20091209.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

/Thanh X Luu/
Primary Examiner, Art Unit 2878

EXAMINER'S AMENDMENT AND STATEMENT OF REASONS FOR ALLOWANCE

Status of Claims

Claims 5, 8, 9, 13, 14, 15, 18, 21 and 22 are amended.

Claims 5-18 and 21-23 are pending.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney James C. Wray on 9 December 2009.

The application has been amended as follows:

Please Amend Claim 15 to the following:

Claim 15 A Pressure tank apparatus, comprising a tank having an inlet and outlet, an optical fiber secured to an outer surface of the tank and having opposite ends for receiving and outputting light, the opposite ends being fixed near the inlet and outlet for connecting respectively to a light source and to a light sensor as the tank is filled with gas under pressure, the optical fiber crossing over itself on the outer surface of the tank and forming micro bends and micro bend pinch points where the optical fiber crosses over itself ~~at the crossings~~, and a composite material overwrap covering the optical fiber and for withstanding internal pressure within the tank and resisting expansion of the tank.

Please Amend the Title to the Following:

"Fiber optic sensors for composite pressure tanks with micro bend pinch points"

Allowable Subject Matter

Claims 5-18 and 21-23 are allowed over the prior art of record.

The following is an examiner's statement of reasons for allowance:

Regarding claim 5, the prior art of record fails to teach alone or in combination a sensor apparatus for tank volume change, comprising along with the other claimed features, an optical fiber that is wound helically in first spaced coils over the tank in a first direction and is wound helically in second spaced coils over the tank and over the first spaced coils in a second direction, and wherein the first spaced coils form the obstructions and the second spaced coils form micro bends where the second spaced coils cross over the first spaced coils as micro bend pinch points, wherein the tank comprises an aluminum tank liner, and the covering comprises

Regarding claim 8, the prior art of record fails to teach alone or in combination a method of providing sensors for tank volume changes, comprising, along with the other claimed features, providing obstructions on the tank liner, providing micro bend pinch points in the optical fiber by crossing the optical fiber over the obstructions and securing the entire optical fiber or at least the micro bend pinch points to the tank.

Regarding claim 15, the prior art of record fails to teach alone or in combination a pressure tank apparatus comprising, along with the other claimed features, an optical fiber crossing over itself on the outer surface of the tank and forming micro bends and micro bend pinch points where the optical fiber crosses over itself.

Regarding claim 21, the prior art of record fails to teach alone or in combination a pressurized fluid storage tank apparatus comprising, along with the other claimed features, a tank liner expansion indicating telephone grade optical fiber helically wrapped around and bonded to the tank liner with epoxy or polyurethane bonding agents in crossed first and second helixes from the neck to the closed end and back to the neck and the telephone grade optical fiber in the second helix having cross over points forming micro bend pinch points.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Francis M. LeGasse Jr whose telephone number is (571) 272-9798. The examiner can normally be reached on Monday through Thursday 7:00 am to 5:30 pm E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Francis M. LeGasse Jr.
Patent Examiner AU 2878
571.272.9798

/Thanh X Luu/
Primary Examiner, Art Unit 2878